



**Search for the Founding Chief Technology Officer
BioMADE
San Francisco, CA; St. Paul, MN; and Cambridge, MA**

THE SEARCH

The Bioindustrial Manufacturing and Design Ecosystem (BioMADE) welcomes applications and nominations for the Founding Chief Technology Officer (CTO). The CTO will serve on the BioMADE senior leadership team alongside the Chief Executive Officer (CEO), Chief Financial and Operations Officer (CFOO), and Chief Workforce Development Officer (CWDO).

BioMADE is an independent, nonprofit public-private partnership established by the U.S. Department of Defense as part of the Manufacturing USA network in late 2020. The total initial investment of public and private funds was \$275 million. BioMADE has the mission of building a sustainable, domestic end-to-end bioindustrial manufacturing ecosystem that will enable domestic bioindustrial manufacturing at all scales, develop technologies to enhance U.S. bioindustrial competitiveness, de-risk investment in relevant infrastructure, and expand the biomanufacturing workforce to realize the economic promise of industrial biotechnology.

For more information about BioMADE, institute leadership, and Manufacturing USA, please see the appendix starting on page 6 of this document.

BioMADE has retained Isaacson, Miller to assist in this important recruitment. Please direct all inquiries and applications to Isaacson, Miller as indicated on page 4 of this document.

THE CTO ROLE AT BioMADE

The CTO will join an organization with the resources and mandate to create innovations within the whole of the U.S. biomanufacturing industry. Rather than managing the technology of a single institution, the BioMADE CTO is charged with operating a research agenda that marshals innovations from across member institutions for the advancement of U.S. biomanufacturing competitiveness. Together with a Government CTO partner representing the Department of Defense, they will co-chair BioMADE's Technical Committee, comprised of technical experts from a subset of the institute's member organizations. Through this Committee, the CTO will influence and oversee setting of the institute's priorities. Once priorities are set by the Technical Committee, the CTO will drive strategic decisions on biomanufacturing technology, including managing a programmatic budget to catalyze innovation and manufacturing capability development on a national scale.

The CTO will be an innovative strategist who possesses a deep knowledge of the array of science and technology developments required to advance domestic biomanufacturing. They will be skilled at cultivating collaborative efforts across diverse internal and external stakeholders and will possess superior communication and management abilities.

KEY OPPORTUNITIES AND CHALLENGES

The BioMADE CTO will capitalize on this unique opportunity to make an indelible impact on the nation's biomanufacturing ecosystem. To succeed, this individual will be expected to address the following key opportunities and challenges:

Engage and maintain key stakeholder relationships

BioMADE is a membership organization comprised of partners from the industrial, academic, and government sectors. The CTO will be the external face of the organization on matters of science, engineering, and technology development while ensuring these relationships are productive and well maintained. Most partner organizations are making direct financial and time investments in BioMADE and will require regular updates on the institute's progress. The CTO will play a critical role in securing new partnerships across industry and government.

The U.S. Department of Defense (DoD) is a crucial stakeholder in BioMADE. The CTO will work effectively with the Government CTO to develop new programs specifically addressing DoD needs. Regular contact with the DoD and other governmental organizations will be essential.

Influence vision and set strategy around the National Biomanufacturing Roadmap

The CTO will apply experience and understanding of the biomanufacturing process to influence the BioMADE National Biomanufacturing Roadmap. With the Government CTO, they will co-chair BioMADE's Technical Committee (TC), which is the highest technology steering body in the organization. Through the TC, the CTO will influence and oversee setting of the institute's priorities and the development of a Roadmap onto which Project Calls will be mapped. This National Biomanufacturing Roadmap is forward-focused, collaborative, and innovative. Once priorities are ratified by the TC, the BioMADE CTO will drive strategic decisions on biomanufacturing technology, including managing a programmatic budget to catalyze innovation and manufacturing capability development on a national scale to move BioMADE and the domestic biomanufacturing ecosystem forward.

Develop, execute, and maintain a portfolio of member-led projects aligned with the mission

As a cross-cutting leader in science, engineering, development, and manufacturing, the CTO will collaborate with the CEO to ensure the portfolio of BioMADE projects and programmatic offerings are aligned with BioMADE's mission to advance the United States competitive landscape in bioindustrial manufacturing. As the technical leader in the C-suite, the CTO will offer insights and recommendations to ensure the overall technical operations and structure adapt to changing threats or opportunities in the domestic ecosystem. The CTO will ensure that Programs

aggressively identify intellectual property creation and facilitate its distribution within the institute's IP framework. The BioMADE CTO appropriately weighs input from the Government CTO and Technical Committee, but is the sole technology voice on the BioMADE C-suite leadership team.

Build a world-class program management and research team

The founding CTO will hire, inspire, develop, and manage a talented and engaged internal team with a wide range of responsibilities, knowledge, and experience. They will oversee units including program managers, technoeconomic and life cycle analysts, research, and manufacturing engineers. They will help team members achieve BioMADE's goals by supporting and mentoring them in their work, communicating openly with them, building a culture of diversity and inclusion, and providing executive leadership. Additionally, the CTO will promote access to technical training and professional development to ensure employees stay current with technology trends, safety and regulatory standards, and cyber best practices.

Lack of reliable technoeconomic and life cycle analyses present a critical gap in advancing biomanufacturing projects across the "Valley of Death" towards commercial realization. The CTO will create an agile, effective technoeconomic analysis capability to ensure BioMADE programs and projects are focused on things that matter.

Collaborate with BioMADE CWDO to align technical and workforce development programs for impact

BioMADE also has a mandate to develop, support, and nurture a national biomanufacturing workforce. The CTO will periodically collaborate with BioMADE's Chief Workforce Development Officer (CWDO) to ensure that their national training focus is consistent with the training and skill development in current and emerging technology programs so that the technical and workforce programs work seamlessly to ensure the existence and readiness of a trained industrial biotechnology workforce. The CTO and CWDO will partner to ensure their respective program areas are aligned for maximum synergy.

Collaborate with the Government CTO and Program Management Team to identify and develop defense capabilities

As the technical leader in a Department of Defense (DoD) initiated institute, the CTO will collaborate and engage across the DoD and U.S. Government to identify areas where bioindustrial manufacturing can be leveraged to bring new capabilities to life. The CTO and their program management team will develop relationships across the government to build a program of work relevant to government interests and to strengthen the industrial base. They will bring agile leadership to the development of technical work through collaboration and coordination with the Government Program Management Team.

Lead the development and management of BioMADE pilot infrastructure

To accomplish its mission, BioMADE will take a lead role in solving the domestic pilot scale infrastructure shortage for bioindustrial materials. The CTO will play a substantial role in developing the strategy and tactics for this effort. As definitive plans for physical pilot scale infrastructure take shape, the CTO will ensure that the C-suite leadership team is apprised of implications of such physical infrastructure, including making recommendations for how such facilities will be managed and operated.

THE SUCCESSFUL CANDIDATE

While no candidate will embody every quality, the successful candidate will bring most, if not all, of the following professional qualifications and personal attributes:

- PhD in chemical engineering, bioengineering, microbiology, biochemistry, chemistry, or related field, or equivalent industry experience.
- Demonstrated leadership in a technology development role.
- Significant managerial experience, particularly across a portfolio of research endeavors.
- Experience with organizations that have moved beyond discovery to validation and larger-scale manufacturing.
- Exceptional team management skills.
- Excellent verbal and written communication.
- Ability to delegate efficiently.
- Experience working in federally funded environments.
- Demonstrated ability to execute and make industry and science act responsibly.
- Comfort and experience working in security-sensitive environments; ability to meet ITAR and security clearance requirement as the scope of work includes access to information and technology that may be regulated under the ITAR and/or is classified.

APPLICATIONS AND NOMINATIONS

BioMADE has retained the national executive search firm Isaacson, Miller to assist in this recruitment. All inquiries, nominations, referrals, and applications should be submitted in confidence to:

Andrew Lee, Partner
Keith Mason, Senior Associate
Isaacson, Miller
Washington, D.C.
<http://www.imsearch.com/7832>

Electronic applications are strongly encouraged.

Chief Technology Officer
BioMADE

BioMADE recognizes the value of diversity in the scientific endeavor. We nurture merit, talent, and achievement by supporting equal opportunity and encouraging diversity in our membership and through participation in our programs and activities.

Consistent with applicable Federal and State law, BioMADE does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy, disability, age, medical condition, ancestry, marital status, citizenship, sexual orientation, status as a Vietnam-era veteran or special disabled veteran, or any other protected characteristic. This nondiscrimination policy covers employees, contractors, members, and participants in BioMADE programs and activities.

BioMADE is committed to providing an environment free from sexual harassment. All members of the BioMADE community should be aware that BioMADE prohibits harassment of any kind, including sexual harassment, that violates law and BioMADE policy.

APPENDIX:

BioMADE Leadership

Douglas Friedman is the **Chief Executive Officer (CEO)** of BioMADE. He is passionate about building networks of companies, institutions, scientists, and engineers to advance modern biotechnology to solve major societal challenges. His primary scientific and technical interests lie in the fields of engineering biology, biotechnology, and physical organic chemistry. Doug's policy interests include governance of biotechnology, safeguarding the bioeconomy, and accelerating scientific advancement by building diverse, robust community partnerships. He regularly serves as a subject matter expert on emerging biotechnologies, biotechnology policy, and national security topics at the interface of the biological and chemical sciences.

Prior to his role as Executive Director at the Engineering Biology Research Consortium, Doug was a study director and senior program officer with the Board on Chemical Sciences and Technology at the National Academies of Sciences, Engineering, and Medicine. He directed seven major studies and supported numerous workshops and other activities. His primary portfolio focused on science and engineering at the interface of chemistry and biology, often as they related to national security.

Earlier in his career, Doug performed research in physical organic chemistry and chemical biology in academia and industry. He earned a Ph.D. in Chemistry from Northwestern University and a B.S. in Chemical Biology from the University of California, Berkeley.

Thomas Tubon is the **Chief Workforce Development Officer (CWDO)** of BioMADE. His advocacy for workforce development has brought together industry, academic, government, and community leaders in a unified voice to advance our nation's bioeconomy and STEM talent pool. His vision for education and workforce development for BioMADE is established on a foundation of teaching and research that includes the design of numerous bioscience workforce readiness programs, community outreach and engagement strategies, building national networking capacity, and integration of broad societal impacts for a diverse and inclusive workforce. He is involved in national-level efforts across agencies and with key stakeholders to promote the agenda of a comprehensive approach to creating a sustainable and vibrant bioindustrial workforce.

His background and experience prior to joining the BioMADE team includes a career in education and biotechnology workforce program development at Madison College and the University of Wisconsin Madison, alongside several leadership positions with the NSF InnovATEBIO National Center for Biotechnology Education, the National Center for Advancing Research Impacts in Society (ARIS), as Executive Director for the Coordination Network for Advanced Biomufacturing, and service on industry, academic, workforce agency boards.

Tom earned his Ph.D. in Molecular Genetics at the Stony Brook University and Cold Spring Harbor Laboratory and has extensive experience in molecular neuroscience, regenerative manufacturing, and translational research.

As with the CTO role, the **Chief Financial and Operations Officer (CFOO)** role is under recruitment.

About Manufacturing USA

BioMADE is part of the Manufacturing USA® network of [16 specialized institutes](#). Each institute focuses on a different advanced manufacturing technology area, but all work in concert to accelerate U.S. advanced manufacturing as a whole, by specifically addressing a challenge the U.S. faces: the translation of technical innovation into large-scale U.S. production.

Manufacturing USA was created in 2014 to secure U.S. global leadership in advanced manufacturing through large scale collaboration on technology, supply chain, and workforce development. The network includes the U.S. Departments of Commerce (DOC), Defense (DoD), and Energy (DOE), their sponsored manufacturing institutes, and six other federal partner agencies: National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), Health and Human Services (HHS), and the Departments of Agriculture, Education, and Labor. Together, they work towards accomplishing national manufacturing objectives to secure America's future through manufacturing innovation, education, and collaboration.

About BioMADE

BioMADE is a new U.S. Department of Defense sponsored biomanufacturing independent nonprofit with public-private partnerships and an initial investment of \$275 million. BioMADE is an independent 501(c)(6) non-profit established in July 2020 by leaders of the Engineering Biology Research Consortium (EBRC).

The BioMADE approach is to marshal insights from manufacturers and innovators to advance bioindustrial manufacturing technologies arising from a robust, but unstructured, U.S. innovation ecosystem. It will accelerate commercialization of products of modern biotechnology and secure domestic supplies of materials and talent. BioMADE is poised to nucleate the ecosystem to catalyze domestic development of products by focusing on Manufacturing Readiness Levels (MRL) 4 to 7. Currently, those working to develop potential bioindustrial applications at early stages (MRL 1-3) are unable to reliably transition to pilot and advanced manufacturing (MRL 7-10) partners. These transitions are hindered by a scarcity of domestic intermediate-scale infrastructure and a technology gap for predicting performance during scale up across MRL 4-7. Through technical innovation, improved domestic infrastructure availability, and maintaining robust connectivity, BioMADE will help de-risk the process of bringing new products to market and stimulate investment in biomanufacturing.

Government and private sector investment in synthetic biology has built a strong industrial ecosystem at the early end of the value chain. Unfortunately, the promise of *at-scale* production from these companies has yet to be fully realized. BioMADE's approach will **Manipulate**, **Accumulate**, **De-Risk**, and **Execute** through the MRL 4-7 transition. A central philosophy for management is leverage what exists, adapt what is adjacent, and create for impact. More specifically, BioMADE will:

Manipulate: develop predictive models, new tools, and robust platforms that will ease the transition from lab to production scale.

Accumulate: produce relevant scales as quickly and efficiently as possible. This will be accomplished through a network of preferred sites capable of pilot-scale production, leveraging commercial partnerships not currently available.

De-risk: explore and evaluate new technologies, particularly around scale-up and downstream processing, and partner with stakeholders to clarify market potential. This will incentivize private investments that will sustain future growth of bioindustrial manufacturing.

Execute: focus its network on manufacturing at pilot and intermediate scale to readily transition to production partners. While this often involves traditional manufacturers, BioMADE may also create the ability to produce high quality materials by alternative means or scales. Critically, BioMADE will develop the needed workforce and regulatory packages required to ensure the technical successes are able to reach their end-to-end potential.

BioMADE's vision to build a sustainable, domestic end-to-end industrial biomanufacturing ecosystem will only be realized if the organization can propel research and development products toward commercial viability by providing a clear trajectory through MRLs 4-7. The BioMADE team is best suited to bring the U.S. bioindustrial ecosystem together to develop compelling technologies, enable defense capabilities, and secure the domestic supply chain.

The figure on the next page illustrates BioMADE's unparalleled 96-member team, including 31 companies, 57 colleges and universities (33 research institutions and 24 training schools), two venture capital groups, and six nonprofits across 31 states. The team includes a broad representation of the domestic capabilities in industry and academia and represents the "end-to-end" ecosystem required to advance the bioeconomy. Industry members include institutions with annual revenues in excess of \$100B, as well as diverse small and medium-sized companies that span the bioindustrial manufacturing space. Academic members include institutions with world-renowned R&D footprints in the biotechnology and bioindustrial manufacturing industries.

